

## Emerging Antimicrobial Resistance among Human *Salmonella* Isolates to Clinically Important Antimicrobial Agents, NARMS 1996 -1999

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**Background:** Although antimicrobial therapy is not essential for most *Salmonella* infections, it may be life-saving for thousands of invasive infections that occur each year in the United States. Fluoroquinolones (e.g., ciprofloxacin), third generation cephalosporins (e.g., ceftriaxone), and gentamicin are commonly used antimicrobial agents for the treatment of invasive salmonellosis; although antimicrobial resistance is increasing among clinical *Salmonella* isolates, resistance to these clinically important agents has been infrequently reported.

**Methods:** After serotyping, public health laboratories in the 17 state or local health departments (1998 population 100 million persons) participating in the National Antimicrobial Resistance Monitoring System (NARMS) for Enteric Bacteria forward every tenth nontyphoidal *Salmonella* isolate to CDC. Antimicrobial susceptibility is determined for 17 antimicrobial agents using broth microdilution.

**Results:** To date, 5011 isolates have been tested; 1326 in 1996, 1301 in 1997, 1466 in 1998 and 918 in 1999. The percentage of *Salmonella* isolates which were highly resistant (resistant to >8 agents) increased from 0.3% in 1996 to 2% in 1999. Overall, 3% (150) of isolates were resistant to gentamicin. The prevalence of resistance to ceftriaxone increased from 0.1% (1) in 1996 to 0.7% (10) in 1998 and 0.5% (5) in 1999. Emerging decreased susceptibility to fluoroquinolones is also evident; 0.4% (5) isolates had a decreased susceptibility to ciprofloxacin (MICs of >0.25) in 1996 compared with 1% (10) in 1999.

**Conclusion:** Antimicrobial resistance is emerging among *Salmonella* to clinically important antimicrobial agents; an increasing proportion of isolates are highly resistant, there is a noteworthy prevalence of resistance to gentamicin, an increasing prevalence of resistance to ceftriaxone, and evidence of decreased susceptibility to fluoroquinolones. Mitigation efforts are needed to preserve the efficacy of these essential agents.

### Suggested citation:

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